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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/574,067	03/30/2006	Dagnachew Birru	PHUS030387	9395
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EXAMINER				
GHULAMALL QUTBUDDIN				
ART UNIT		PAPER NUMBER		
2611				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/574,067

Applicant(s)

BIRRU, DAGNACHEW

Examiner

Qutbuddin Ghulamali

Art Unit

2611

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
- Paper No(s)/Mail Date 3/30/06
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 12 recites the limitation "the non-coherent signal" in last line. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-4, 7, are rejected under 35 U.S.C. 102(e) as being anticipated by McCorkle et al (US Pub. 2003/0054764).

Regarding claim 1, McCorkle discloses a method of conveying a high-speed digital data stream, comprising:
encoding the data stream into two-pulse duplets (pulse wavelets) having a first and a second pulse for each bit of the data stream (page 2, section, 0013, 0022, 0023; page 5, section 0049, 0050); and
transmitting a carrierless ultra wideband signal via an antenna, said ultra wideband signal including said duplets (page 5, sections 0048, 0052).

Regarding claim 2, McCorkle discloses setting a phase difference between the first pulse and the second pulse to $\pi/2$ (page 3, section 0024; page 4, sections, 0036, 0039).

Regarding claim 3, McCorkle discloses encoding a $\cos(wt)$ for a 1 bit during a first sub-pulse time slot and then a $\sin(wt)$ signal second sub-pulse time slot; and encoding a $\sin(wt)$ during a first sub-pulse time and then a $\cos(wt)$ in a second sub-pulse time slot (page 3, section 0024; page 4, section 0036, 0039).

Regarding claim 4, McCorkle discloses combining the encoding with at least one of pulse position modulation and multi-band modulation (page 3, section 0024; page 5, section 0053, 0056); and within each band, employing at least one of time, amplitude and phase modulations (page 5, section 0053, 0055, 0056).

Regarding claim 7, McCorkle discloses decoding said high-speed digital data stream into a bit stream from said two-pulse duplets included in said received carrierless ultra wideband signal (page 6, sections 0061, 0062, 0063).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 5, 6, 8-10 are rejected under 35 U.S.C. 103 (a) as being unpatentable over McCorkle et al (US Pub. 2003/0054764) in view of Kim et al (US Pub. 2004/0257167).

Regarding claim 5, McCorkle discloses substantially the claim above, however, does not explicitly disclose a pseudorandom frequency sequence to provide sufficient reduction of multi user interference. However, Kim discloses pseudorandom frequency sequence to reduce noise (page 1, section 0011). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use pseudorandom sequence the as taught Kim in the circuit of McCorkle because it can improve reduction of multi user interference in receivers.

Regarding claim 6, McCorkle discloses substantially all limitations of the claim above, however, does not explicitly disclose receiving a non-coherent receiver. However, Kim discloses performing communications using non-coherent receiver (page 1, section 0013). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a non-coherent receiver for receiving signals as taught by Kim in the circuit of McCorkle because it can provide better receiver operation by reduction of multi user interference during reception.

Regarding claims 8, 10, the claims substantially recite those addressed with the limitations of claims 1 and 2 above, and therefore, their rejection treated likewise.

Regarding claim 9, McCorkle discloses signal controls at least one device selected from group consisting of video, audio, sensor, alarms, computers, audio, visual entertainment system (page 2, section 0010, 0011).

8. Claims 11-16 are rejected under 35 U.S.C. 102 (e) as being anticipated by McCorkle et al (US Pub. 2003/0054764) in view of Naiel Askar "Overview of General Atomics PHY Proposal to IEEE 802.15.3a" herein henceforth referred to as 'Askar'.

Regarding claim 11, McCorkle discloses a receiver comprising:
an antenna that receives a carrierless ultra wideband signal conveyed using the method of claim 2 and that includes two-pulse duplets representing each bit of a high-speed digital data stream (page 2, section 0022);
a wideband band-pass filter that filters the received signal (page 5, section 0058);
a low-noise amplifier (LNA, 25), coupled to said band-pass filter, that amplifies said filtered signal (page 5, section 0058);
a gain unit (controller and correlator) that performs one of amplifying and reducing the signal output by the LNA to an appropriate level (page 5, section 0058, 0059);
a bank of voltage controlled oscillators (timing generator) (VCOs) that locally generates a free-running sinusoidal wave form (McCorkle discloses timing generator and waveform generator that locally generate clock frequency but does not label it as VCO's. However, design and use of voltage controlled oscillators for timing purposes is

generally well known in the art) (page 5-6, section 0059, 0060). McCorkle does not explicitly disclose a non-coherent receiver, a mixer that mixes (multiply) output of gain unit with local signal (oscillator signal) to result in mixed waveform, a low pass filter and a modulator that converts the pulse signal from filter. However, Askar discloses reference to performance bound spectral keying for coherent and non-coherent receiver (page 20-22) (Note, the demodulation of modulated UWB system is based on design choice as disclosed in Askar the performance of coherent vs. non-coherent receivers may be identical);

a mixer that multiplies the output of the gain unit with the sinusoidal waveform to result in a mixed waveform (example shown, see page 30);

a low pass filter through which the resulting mixed waveform is passed to produce a low-pass signal (example shown, see page 30); and

a demodulator (FSK demodulator) that converts each two-pulse duplet of the low-pass signal to a single pulse for each bit transmitted via the phase of the low-pass signal (see example page 30). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a mixer, a low pass filter and demodulator as taught by Askar in the system of McCorkle because it would allow mixing of received signal, mitigate interference in signal by passing it through low pass filter and demodulate to recover the desired signal as appropriately desired to obtain the transmitted signal at the receiver.

Regarding claim 12, McCorkle discloses combining the encoding with at least one of pulse position modulation and multi-band modulation (page 3, section 0024;

page 5, section 0053, 0056); and within each band, employing at least one of time, amplitude and phase modulations (page 5, section 0053, 0055, 0056).

Regarding claim 13, McCorkle does not explicitly disclose demodulator converts each two-pulse duplet into a single pulse that is independent of frequency and phase mismatches. However, Askar discloses demodulator converts each two-pulse duplet into a single pulse that is independent of frequency and phase mismatches (see example page 30). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a demodulator as taught by Askar in the system of McCorkle because it would allow demodulation of received signal to be recovered appropriately desired to obtain the transmitted signal at the receiver.

Regarding claim 14, McCorkle discloses carrierless wideband signal is a multi-band signal (abstract; page 2, section 0013; page 3, section 0024); an expected center frequency of the received carrierless wideband signal is known in advance (page 3, section 0035); and the frequency of the VCOs is set equal to that of the received carrierless wideband signal (page 3, section 0033, 0035; page 4, section 0038, 0039).

Regarding claim 15, McCorkle discloses frequency sequence of the received carrierless wideband signal is established by transmission of one of (1) a preamble (known reference, page 6, section 0060) and (2) a known reference sequence for a short period of time (page 6, section 0060, 0061).

Regarding claim 16, McCorkle discloses substantially all limitations of the claim except does not explicitly disclose one of a Rake receiver and a receiver based on

equalization that processes said received signal and outputs a signal that is combined with the output of the non-coherent signal to produce each bit of the high-speed data signal. However, Askar discloses a 5 band SK receiver that provide Rake combiner processes said received signal and output a signal that can combined with the output of the coherent or non-coherent signal to produce each bit of the high-speed data (see page 30, 31).). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Rake receiver with Rake combiner as taught by Askar in the system of McCorkle because it can allow tracking signal peak on each band individually by providing improved performance, reduced hardware with little impact on overall complexity in the receiver.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patents:

USP (5,960,031) to Fullerton et al.

US Pub. (2005/0084031) to Rosen et al.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutbuddin Ghulamali whose telephone number is (571)-272-3014. The examiner can normally be reached on Monday-Friday, 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QG.
June 9, 2009.

/Chieh M Fan/
Supervisory Patent Examiner, Art Unit 2611